Chapter 6 – Identifying Key Reports, Initiatives, or Strategies as Planning Tools for Implementation

Summary of Past Studies, Initiatives, and Strategies

Another source of implementation strategies for this WMP are the past studies that have been completed for this watershed in particular or the greater Saginaw Bay Watershed. All of these works should be reviewed and whenever possible implement the strategies along with this WMP to address issues in the watershed.

Vision of Green

Green infrastructure systems help protect and restore naturally functioning ecosystems and provide a framework for future development. A well planned, managed, and maintained green infrastructure system can provide many ecological, social, and economic benefits:

- Enhance biodiversity by supporting native species and protecting wildlife habitat.
- Filter and store fresh water by maintaining natural landscape processes.
- Carry storm water and reduce flooding by protecting floodplains.
- Clean polluted air and moderate air temperatures by maintaining forest cover.
- Reduce public costs associated with water treatment, flood protection, and air quality.
- Improve health and increase physical activity by providing open space for recreation and non-motorized transportation.
- Provide a sense of place by connecting people to the nature, history, and culture of their communities.
- Increase property values and stimulate private investment by enhancing quality of life amenities such as access to open space, recreational. opportunities, transportation choices, and a clean, green environment.

The major goal of this initiative by the Conservation Fund and supported by Saginaw Bay WIN is to add over 50,788 acres of land for recreation and conservation in Bay County alone, a lot of it in the watershed. Also this initiative is proposing to add 94 miles of proposed trails in Bay County, it would be conducive to propose adding a water trail along the North Branch of the Kawkawlin to this trail system. These must be promoted as an action item for the Kawkawlin watershed.

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Recommendations from the report:

- Develop a "implementation quilt" that identifies: different land uses, conservation activities, and stakeholders within the green infrastructure network; potential funding sources and programs (federal and state programs,

land protection tools and techniques, regulatory tools, rates/fees, public financing options); different stages of green infrastructure projects (planning, capital projects, land acquisition, education and outreach, management and maintenance); which agency, organization, or partnership should take action on specific green infrastructure projects.

- Establish a "Green Infrastructure Fund" to be used for greenway and open space acquisition, natural resource restoration, and recreational improvements in accordance with completed greenways and/or green infrastructure plans. Funds could also be used to develop multi jurisdictional green infrastructure plans. It is anticipated that this private sector fund will leverage both state and federal funding sources for acquisition and project implementation. The GreenWays Initiative of Southeastern Michigan provides a similar model and on an average, leverages $8 public dollars for every $1 from the private GreenWays Fund.
- Encourage state and local governments, private sector, and conservation organizations to use the Vision of Green plan to set priorities and strategically guide their conservation funding and investment in the region.
- Explore, in cooperation with municipalities, the use of developmental impact fees, tax incentives, and other strategies for application to green infrastructure implementation.
- Assess and investigate the suitability and feasibility of public financing options for green infrastructure projects, including ballot initiatives.
- Assist the region in determining the feasibility of developing a farmland preservation and purchase of development rights program.
- Pursue with the private sector the development of a low-interest loan program that allows nonprofit conservation organization and local governments to acquire an interest in private land to protect critical natural environments and preserve farmland and open space through the purchase of development rights, conservation easements, and similar mechanisms.
- Work with the state to expand the Conservation Reserve Enhancement Program, which targets the Saginaw Bay Watershed. The program, which pays farmers to establish and maintain buffer strips along water courses, has been beneficial to farmers, wildlife and wildlife corridors, and water quality.

Priority Conservation Lands Assessment – Tittabawassee River Watershed (2006)

This study completed by the Little Forks Conservancy regarding the assessment of conservation lands in many counties in the Kawkawlin Watershed, besides the Tittabawassee River Watershed, looked at conservation planning approaches in Bay County and other portions of the watershed. It created a landscape level prioritization of the lands in the watershed and produced county defined maps to prioritize lands for conservation acquisition. The other features included landscape connectivity and the financial costs along with distance to human stressors. This reference will be valuable in assessing lands within the watershed for conservation and should be used to the extent practicable to identify and acquire and promote connectivity of lands.

DNRE Studies

These have been covered in previous chapters and are available in the Appendix XX.

Bay County Build-Out Assessment (September 2000)

A Build-Out Assessment performed on the Bay County municipalities builds the ground work for strategies that can be used to stifle urban sprawl, preserve remaining ecological areas and rural character of the region, and coordinate planning between municipalities to build a strong regional growth management plan.

The assessment addressed the issue of urban sprawl in the Bay County region and correlated various types of information including land use, zoning, water and sewer districts, and areas needing protection from development like; wetlands, floodplains, lake plain prairies, and prime agricultural land. With this information compiled, a plan was developed to mitigate the urban sprawl into the undeveloped regions of Bay County and concentrate new developments in certain "developable" areas.

Recommendations from the report:

- The adoption and implementation of a Growth Management Plan(GMP) by Bay County municipalities for the entire county.
- Model a GMP from the Smart Growth Code developed by the American Planning Association featuring flexible planning with regional perspectives.
- Form a coordinating committee, comprised of members from each municipality in the area, to build the regional GMP:
- Major areas of focus of the coordinating committee shall be to:
    - Establish an urban growth boundary that can support population growth within a 20 year period with a possibility of minimum densities stipulated.
    - Identify land that needs to be preserved and which land would be appropriate for development.
    - Preserve agricultural lands, to maintain rural character, through farm linkages (connecting farm sellers with farm buyers), agricultural zoning, development right programs or conservation easements.
    - Protect environmental areas, including wetlands, forests, watersheds, and critical habitats, while developing.
    - Reinvest in downtown areas by redeveloping brown fields, financially support developments with in the current water and sewer districts, and encourage development in urban centers.
    - Provide housing at reasonable cost for elderly, disabled and low income citizens.
    - Ensure the availability of alternative modes of transportation in urban centers.
- Establish common county goals that all municipal master plans must address as elements in the areas of:
    - Land use, transportation, community facilities, mineral resources, sensitive areas (streams, buffers, critical habitats, 100-year floodplains,

threatened and endangered species habitat, steep slopes), affordable housing, and economic development.

- Enact a policy that local master plans be consistent with the regional GMP.
- The best suited areas for development, determined through Smart Growth principles are:
    - The Greater Bay City Area
    - The Williams Township/US-10 Corridor
    - The northern portion of Kawkawlin Township between I-75/US-23 and M-13
    - The City of Pinconning and Pinconning Township

Remedial Action Plan for Saginaw Bay and Saginaw River (September 1988)

In 1988 a Remedial Action Plan was formulated for the whole Saginaw Bay Water shed and the Saginaw Bay. The report discusses the specifics of the watershed ands its sub watersheds, descriptions of all the problems found in the region, sources of these pollutants, past actions and the remedial action plan. The report compiled the statistics on different contaminant levels in the Kawkawlin River which is in the table below:

Contaminant	*Amount*	*Year*	*Contaminant*	*Amount*	*Year*
BOD	6 mg/L	1964	BOD	3 mg/L	1974
Suspended Solids	37 mg/L	1963	Suspended Solids	17 mg/L	1975
Total Solids	505 mg/L	1969	Total Solids	365 mg/L	1975
Phosphorus	0.15 mg/L	1968	Phosphorus	0.12 mg/L	1975
Orthophosphorus	0.1 mg/L	1964	Orthophosphorus	0.055 mg/L	1975
NO2 & NO3	1.25 mg/L	1973	NO2 & NO3	2 mg/L	1975

The description of point sources along the Kawkawlin River includes three minor industrial discharges and eight minor municipal discharges. The description of nonpoint sources along the Kawkawlin River includes erosion of the agricultural land and phosphorus loads from fertilization and animal waste. Bay County was ranked seventh worst out of the fifteen counties in the Saginaw Bay watershed with a total erosion load of 712,000 tons per year which was 7.4% of the total sediment load in the Saginaw Bay. The nonpoint source of phosphorus pollution from the Kawkawlin River basin was 29.3 tons in 1982. With growing popularity of fertilization the soil tests in Bay County were 27 pounds per acre in 1962 and grew to 222 pounds per acre in 1986. No specific data about phosphorus pollution from animal waste was included. These two source types of pollution were specific to the Kawkawlin River watershed.

<u>Recommendations form the report:</u>
The remedial action plan for the region included plans for each source of pollution. Point source plans included:

- Expanding the NPDES permit compliance monitoring capabilities to detect lower profile violations.

- Update waste water treatment plants that discharge into the Saginaw Bay to prevent accidental discharges.
- Determine the amount of phosphorus coming from point sources by comparing them to nonpoint source phosphorus pollution amounts.

Nonpoint source plans include:

- Establish of a permanent Nonpoint Source Pollution Control Committee which would act as an interagency cooperation to organize effort in Saginaw Bay water quality.
- Determine potential benefits to restoring select areas to their approximant natural state.
- Encourage the use of the following BMPs:
    - Permanent Vegetative Cover Establishment and Improvement
    - Trip-cropping Systems
    - Terrace Systems
    - Diversions
    - Grazing Land Protection
    - Windbreak Restoration or Establishment
    - Cropland Protective Cover
    - Farmstead and Feedlot Windbreaks
    - Permanent Vegetative Cover on Critical Areas
    - Vegetative Row Barriers
    - Contour Farming
    - Reduced Tillage Systems
    - Crop Residue Management
    - No-Till Systems
    - Water Impoundment Reservoirs
    - Sediment Retention, Erosion or Water Control Structures
    - Stream Protection
    - Sod Waterways
    - Animal Waste Control Facilities
- Reinstate an incentive program for implementing additional nonpoint source control measures.
- Educate agricultural producers on how to reduce pollutant loads.
- Quantify the effectiveness of each BMP.
- Collect and analyze sediment samples from the mouth of rivers tributary to the Saginaw River and the Saginaw Bay during different flow conditions to get a comparison of sediment loads and contaminants in each tributary.
- Conduct a livestock census and compare the potential animal waste nutrients to the nutrients in the select watershed.
- Determine how much pollutant come from urban runoff and septic system seepage.
- Impose development of CSO controls and urban stormwater runoff controls to municipalities.
- Reduce fertilizer levels spread onto crops.

Measures of Success: Addressing Environmental Impairments (August 2000)

This report provides a discussion on the progress of the Remedial Action Plan that was drafted in 1988. In the areas of bacteria, contaminated sediments, fisheries, wildlife and bay ecosystem, this report covers a description of impairments, history of that impairment, what we have done to overcome it, and the evaluations of that progress with goals and next steps for the future.

Bacteria concerns since the late 1800's due to the discharge of untreated sewage has come a long way since the area was settled but improvements are till being planned to make the Saginaw Bay waters cleaner. Their suggested steps include:

- Establish appropriate sampling method to monitor bacteria levels in the Saginaw River.
- Eliminate all known SSOs and all untreated or inadequately treated CSOs.
- Encourage local health departments with public access sites on Saginaw Bay to monitor bathing beach areas from April through October.
- Establish a database and annually summarize the bacteria sampling results from the river and bay, particularly below wastewater discharge points.
- Conduct an annual review of the data collected to determine effectiveness of sampling sites and to identify new sources of waste entering the river or bay.
- Address illicit sanitary connections into storm water systems.

Sediment contamination in this report refers to dealing with the contamination sources in the dense industrial sector and contaminated sediments that are being dredged and re-suspended in the Saginaw Bay. Their plans outlined include:

- Document the improvements in PCB contamination levels in the sediments of the shipping channel of the Saginaw River/Bay following the remedial actions now under way.
- Following completion of the PCB-contaminated sediment removal project, conduct an economic analysis of the cost of routine navigational dredging in the Saginaw River/Bay compared to the cost of comparable dredging in rivers and harbors of the Great Lakes where sediments are not classified a polluted.
- Fully evaluate cuts/slips along the Saginaw River for sediment contamination and work to develop remediation alternatives for any significant sites of sediment contamination identified.

The fisheries efforts discussed in this report deal with the monitoring of substances and fish populations/conditions in the river and bay. Their plans outlined include:

- Reestablish effective dissolved oxygen monitoring in the Saginaw River during critical low-flow summer periods to determine whether or not the water quality standard is being achieved.
- Ensure that all dam release are in compliance with Federal Energy Regulatory Control/state negotiated release level to help maintain adequate flows and dissolved oxygen levels below dams.
- Work with individual communities/citizens/businesses within the watershed to identify dams for potential removal or for installation of fish passage devices.
- Expand public information and education effort to inform the public about the critical role the watershed's rivers play in restoring and sustaining the bay's fisheries.

- Develop a computer-based geographic information system to systematically inventory coastal marsh habitat areas critical to fish and wildlife. The system will identify those areas most at risk and allow for monitoring the success of programs intended to protect these areas.
- Continue to monitor the annual harvest of walleye and yellow perch and conduct annual netting surveys to determine whether or not targeted restored conditions are being met and/or maintained and natural reproduction of walleye continues to provide evidence of improved habitat conditions.
- Identify opportunities provided by the MDNR Fisheries Division Lake Sturgeon Recovery Plan to expedite restoration of this important species in the bay area.
- Establish a baseline of data on the levels of PCBs and dioxins currently found in walleye in the Saginaw River/Bay that can be compared against contaminant levels in walleye taken from other areas of Lake Huron and/or other Great Lakes. Analysis of fish contaminant levels to determine trends is essential to understanding how effective efforts to control toxic pollutants have been whether or not further remedial actions are required.
- Conduct caged catfish studies in the Tittabawassee River downstream of Midland and in the Saginaw River near the mouth following completion of remedial dredging to determine whether or not additional actions are required to control sources of PCBs and dioxins.
- Implement sediment monitoring on the Tittabawassee River Downstream of Midland and on the Saginaw River and Bay after remedial dredging on the Saginaw River is completed to provide a comprehensive baseline for PCB and dioxin/furan levels in this AOC.
- Evaluate alternatives and develop a strategy to effectively disseminate information on Fish Consumption Advisories in the Saginaw River/Bay.
- Conduct a survey of area anglers to determine the location and frequency of any fish taste and/or odor problems.
- Implement investigations/remediation at any sites identified as the source of a pollutant responsible for fish tainting.

This report discussed the history, progress, and future plans of the wildlife in the AOC. Their plans outlined include:

- Incorporate existing information and compile new data within a computer-based geographic information system that clearly identifies Saginaw Bay coastal marsh areas that are essential habitat for fish and wildlife.
- Coordinate with the county drain commissioners to evaluate opportunities for fish and wildlife habitat restoration.
- Establish a coastal habitat index and monitoring system that can be used to periodically document the status of a representative sample of vulnerable wetland areas important to sustaining bay fish and wildlife populations.
- Identify marshes that are particularly vulnerable to upland activities and implement actions to safeguard them and control upland threats.
- Continue support for routine monitoring of bald eagle nesting success within Michigan's Lake Huron shoreline.
- Continue comparative analysis of PCB levels in herring gull eggs from nest sites within Saginaw Bay and those in other areas of Lake Huron.

The Bay Ecosystem is the final issue addressed in this report. Nonpoint sources of phosphorus pollution are still a major challenge referring to agricultural fertilizing, animal waste, failing septic systems, and erosion and sediment transport. Deterioration of buffer areas due to agriculture systems being installed has been a major obstacle to progress against this problem. Sub watershed targeting will be needed to go further with cleanup efforts. Their plans outlined include:

- Prioritize subwatersheds (or smaller sub-ecosystems) that are tributary to the bay on the basis of how much phosphorus they contribute and develop and support plans that will result in significant reductions.
- Track the success of local programs (like the federally funded Conservation Reserve Enhancement Program) that make full usse of available state and federal funds to protect watercourses by providing *buffer strips,* or protective strips of land surrounding bodies of water that can trap and hold nutrients contain in runoff.
- Continue to support efforts to improve and document the management of crop residue, fertilizer, and animal ad human waste application son agricultural land in the basin.
- Monitor Saginaw Bay periodically to determine phosphorus concentrations.

Indirect Ground-Water Discharge to the Great Lakes (1998)

In a report by the U.S. Geological Survey (USGS) an estimate was formed of the average ground-water component of streamflow for 195 streams in the United States Part of the Great Lakes Basin to range between 25 to 97 percent. The study used USGS gauging stations to measure indirect ground-water discharge with hydrograph separation analysis. This measured the portions of discharge into the Great Lakes Basing from surface runoff and indirect ground-water discharge. For the North Branch of the Kawkawlin River which has records of discharge recorded for 30 years, holds an average ground-water component of streamflow for its 101 square mile drainage area to be 65.8%.

Recommendations

This will be developed